

**REMARKS**

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The present invention as set forth in **amended Claim 1** relates to a proton exchange fuel cell, comprising:

a separator which comprises

a separator substrate; and

a multi-coating layer formed on said separator substrate;

wherein said multi-coating layer comprises a peeling resistance layer provided on said separator substrate, a corrosion resistance layer provided on said peeling resistance layer, and a low electric resistance layer provided on said corrosion resistance layer;

wherein a material of said low electric resistance layer has an electric resistance of equal to or lower than  $1000 \mu \Omega \text{cm}^2$ ;

wherein said separator substrate comprises one kind or a composite material of two or more kinds of materials selected from the group consisting of stainless steel, copper, an alloy of copper, aluminum, an alloy of aluminum, titanium and an alloy of titanium;

wherein said multi-coating layer comprises one kind or a composite material of two or more kinds of materials having a low contact resistance selected from the group consisting of Ni, Fe, Co, B, Pb, Cr, Cu, Ti, Bi, Sn, W, P, Mo, Ag, Pt, Au, TiC, NbC, TiCN, TiN, CrN, TiB<sub>2</sub>, ZrB<sub>2</sub>, Fe<sub>2</sub>B, and Si<sub>3</sub>N<sub>4</sub>;

**wherein a film thickness of said corrosion resistance layer is 0.1  $\mu\text{m}$  or more.**

In addition, **new Claims 19 and 20** have been added.

Independent **Claim 19** defines the thicknesses of all three layers as follows. The film thickness of said **low electric resistance layer** is **0.02  $\mu\text{m}$  or more**, a film thickness of said

**corrosion resistance layer is 0.1  $\mu\text{m}$  or more, and a film thickness of said peeling resistance layer is 0.1  $\mu\text{m}$  or more.**

In **Claim 20**, the layer thicknesses are defined as follows. The film thickness of said **low electric resistance layer is 1.0  $\mu\text{m}$  or more**, the film thickness of said **corrosion resistance layer is 1.0  $\mu\text{m}$  or more**, and the film thickness of said **peeling resistance layer is 1.0  $\mu\text{m}$  or more**.

In contrast, Li et al (US 5,624,769) fail to disclose or suggest a **peeling resistance layer provided on said separator substrate, a corrosion resistance layer provided on said peeling resistance layer, and a low electric resistance layer provided on said corrosion resistance layer** as claimed in Claim 1 of the present invention. In addition, the reference fails to disclose or suggest that **a film thickness of said corrosion resistance layer is 0.1  $\mu\text{m}$  or more**.

The reference also fails to disclose or suggest **the layer thicknesses** claimed in new Claims 19 and 20.

Li et al (U.S. Pat. 5,624,769) disclose a PEM fuel cell having electrical contact elements (including bipolar plates/septums) (Li et al, abstract). It comprises a titanium nitride coated light weight metal (e.g., Al or Ti) core 50, having a passivating, protective metal layer 52 intermediate the core 50 and the titanium nitride layer 54 (Li et al, Fig. 2).

The Examiner has pointed out in the discussion of August 24, 2004, that in his opinion the Cr/Ni/Mo-rich stainless steels of Li et al grow a protective oxide barrier (a passivation layer) *in situ*. The Examiner has relied on Li et al, column 3, lines 51-56. Even if the Examiner's assertion was correct, the thickness of the protective oxide barrier layer is not disclosed or suggested. Thus, the present invention cannot be anticipated or obvious over Li et al.

In addition, the thicknesses of the layers as claimed in Claims 19 and 20 are not disclosed or suggested by this reference.

Further, **Claim 18** relates to the proton exchange fuel cell according to Claim 1, wherein **a crystal orientation of each layer of said multi-coating layer is oriented to a direction of a Miller index of (200) or (002)**.

The claimed **crystal orientation of the coating layer** is not disclosed or suggested in Li et al.

Li et al describes the crystal orientation in col. 4, lines 53-55 as follows:

The d-spacing corresponding to  $\gamma(111)$ ,  $\alpha(110)$  and  $\gamma(200)$  peaks were obtained by fitting them with Lorentzians and are given in Table II.

As is clear from the above-description, the crystal orientations of  $\gamma(111)$ ,  $\alpha(110)$  and  $\gamma(200)$  are mixed.

However, in the present invention, the crystal orientation is explained at page 44, line 2 from the bottom through page 45, line 6 and Table 3 of the specification as follows:

As shown in Table 3, almost all of the crystal orientations of the films that showed excellent corrosion resistance oriented to the direction of Miller index (200) or (002).

On the other hand, almost all of the crystal orientations of the corroded films were the crystal orientation plane wherein Miller indices (111), (200) and (002) were mixed.

Claim 18 is supported from the above-description.

Even if the Miller index (200) is included, the films do not necessarily show the excellent corrosion resistance of the films. However, in the case claimed in Claim 18, there is excellent corrosion resistance of the films.

Thus, the present invention as claimed in Claim 18 is not disclosed or suggested by Li et al.

Therefore, the rejection of Claims 1-5 and 17 under 35 U.S.C. §102(b) as anticipated by Li et al (US 5,624,769) and the rejection of Claims 16 and 18 under 35 U.S.C. §102(b) as anticipated by, or in the alternative under §103(a) as obvious over Li et al (US 5,624,769) are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of these rejections is respectfully requested.

In addition, Applicants wish to note that MPEP §821.04 states, "if applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims which depend from or otherwise include all the limitations of the allowable product claim will be rejoined." Applicants respectfully submit that should the elected group be found allowable, the **non-elected claims 6-15 should be rejoined**. The Examiner is respectfully invited to call Applicants' Representative if amendments to the non-elected claims are necessary.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

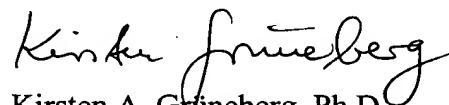
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